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PENSOFT

Elateridae (Insecta, Coleoptera) from Tanegashima Island (Ryukyu Islands, Japan)

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Abstract

There are few records of beetles of the family Elateridae from Tanegashima Island, in the Ôsumi Islands, in the Ryukyu Islands, Japan, and the elaterid fauna of this island has not been reviewed. We examined newly collected specimens and reviewed the previous records from the island. In field work and from a colleague's collection, we found 27 species, of which 13 were recorded for the first time on the island. As result 43 species are confirmed from this island and a checklist of all elaterid species from Tanegashima Island is provided.

Key words

Elaterid beetles, new distributional records, lowland, geographical boundary, Palearctic region.

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Introduction

Tanegashima Island is the easternmost Ôsumi Islands, in the northernmost part of the Ryukyu Islands of Japan. The island is the second largest of the Ôsumi Islands, covering 444 km^2 with a maximum elevation of 282 m (Geospatial Information Authority of Japan 2018, Kyushu Regional Forest Office 2018). Its vegetation is lowland laurel forest. The island occupies an important position biogeographically because it has a large lowland forest near the boundary between the Palearctic and Oriental regions. Chûjo (1973), Hirashima (1989), and Kishii (1999) listed 4, 10, and 16 species, respectively, of Elateridae from Tanegashima Island. Ôhira (1998a, 2000) recorded 9 species from the island and Ôtsubo (2013) reported 8 species as new records. Currently, approximately 30 species have been recorded from this island (Kishii 1999, Ôhira 1996a, 2000, Ôtsubo 2013). In comparison, 639 elaterid species have been recorded from Japan (Ôba et al. 2015). Moreover, there is discordance between information from the distributional records for Tanegashima Island and a checklist of the Japanese elaterid fauna (Kishii 1976b, 1999, Ôhira 2005, Ôtsubo 2013). In this study, we examined newly collected specimens of elaterid beetles, reviewed the previous records, and provide a checklist of the species from Tanegashima Island.

Methods

The authors conducted field work in 13 localities on Tanegashima Island, Kagoshima Prefecture, Japan, from 14–16 July 2017 (Fig. 1). This involved looking, spraying, picking up from rotting wood, and using a simple light trap (SLT) made by combining a flight interception trap with a 4 W fluorescent light for catching insects. The latitude and longitude of the collection localities were recorded using a global positioning system receiver

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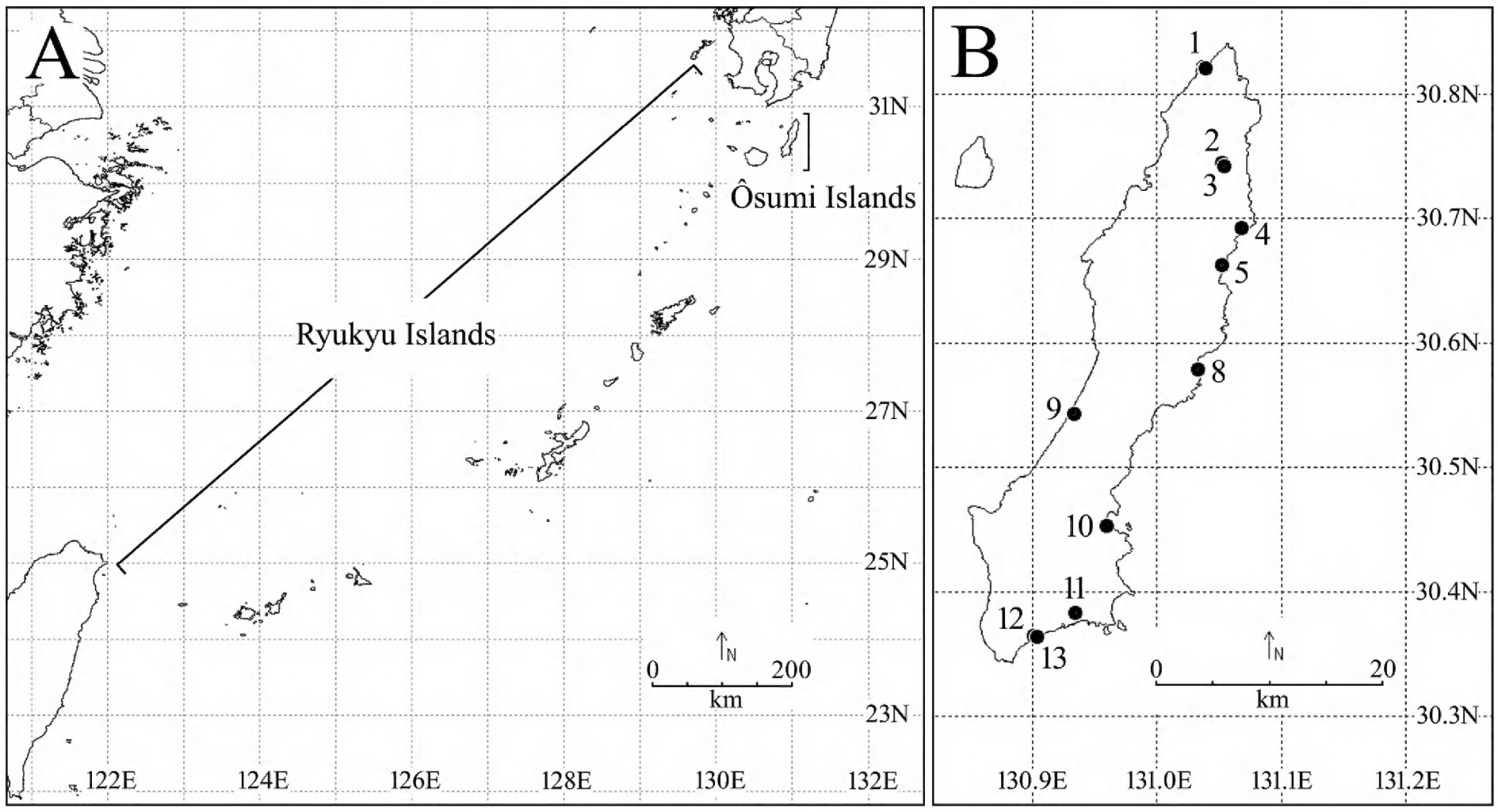

Figure 1. Map of the Ryukyu Islands, Japan. **A.** Location of Ôsumi Islands in the Ryukyu Islands. **B.** Map of Tanegashima Island of Ôsumi Islands, showing the collection sites of the material used in this study. The numbers correspond to the site numbers of Table 1.

(Garmin GPS Map 62s; map datum setting: WGS84) and rounded off to 4 decimal places (Table 1). Altitude was obtained from Google Earth Pro v. 7.3.0.3832 based on the recorded latitude and longitude. The specimens collected in our field work were deposited in the first author's collection and will be transferred to Osaka Museum of Natural History, Osaka, Japan.

We also examined 3 specimens of 2 species collected by colleagues from 2 sites (Table 1: Sites 6, 7): *Paraphotistus notabilis yagi* Kishii, 1982 and *Ampedus* (*Ampedus*) *japonicus japonicus* Silfverberg, 1977. These specimens are in the personal collection of Mr Masaki, Kyoto, Japan.

Specimens were identified using descriptions and identification keys (Arimoto et al. 2015, Kishii 1970, 1975, 1976a, 1982, 1986, 1988, Ôhira 1988, 1997a, 1997b, 1998a, 1998b, 1998c, 2001a, 2001b, 2002a, 2002c, 2003a, 2004, 2005, Ôhira and Suzuki 1985). Specimen codes are provided for the material and given in square brackets [18A001 to 18A352]. All specimens examined were mounted for morphological observation, except for 8 specimens [18A004, 18A111, 18A027, 18A306–18A310], kept in 99.5% ethanol for future molecular analyses.

A checklist was made based on Hirashima (1989) and Kishii (1999), incorporating information from Kishii (1976b), Ôhira (2000, 2005), and Ôtsubo (2013), as well as from the current study.

Results

A total of 352 specimens of elaterid beetle belonging to 6 subfamilies, 21 genera, and 27 species were identified. All species have already been recorded from Japan; however, 13 species are recorded from Tanegashima Island for the first time. Additionally, the records of another 30 species for the island were confirmed based on literature.

Table 1. Collection sites of the material used in this study, Tanegashima Island, Japan.

Site	Locality name	Latitude (N)	Longitude (E)	Elev. (m)	Date
1	Urata Beach, Kunigami, Nishinoomote City, Kagoshima Prefecture	30.8212	131.0389	11	16.VII.2017
2	Mt. Tennyogakura, Annou, Nishinoomote City, Kagoshima Prefecture	30.7452	131.0521	219	16.VII.2017
3	Mt. Tennyogakura, Annou, Nishinoomote City, Kagoshima Prefecture	30.7428	131.0538	216	16.VII.2017
4	Genna, Nishinoomote City, Kagoshima Prefecture	30.6926	131.0676	4	17.VII.2017
5	Kane-hama Beach, Anjô, Nishinoomote City, Kagoshima Prefecture	30.6630	131.0525	2	17.VII.2017
6	Furuta, Nishinoomote City, Kagoshima Prefecture	—	—	—	18.IV.1987
7	Nakatane Town, Kumage District, Kagoshima Prefecture	—	—	—	3.I.1988
8	Masuda, Nakatane Town, Kumage District, Kagoshima Prefecture	30.5786	131.0332	11	17.VII.2017
9	Noma, Nakatane Town, Kumage District, Kagoshima Prefecture	30.5431	130.9336	12	15.VII.2017
10	Kumano Beach, Sakai, Nakatane Town, Kumage District, Kagoshima Prefecture	30.4532	130.9593	4	15.VII.2017
11	Kukinaga, Minamitane Town, Kumage District, Kagoshima Prefecture	30.3830	130.9343	23	15.VII.2017
12	Near Maeno-hama Beach, Nakanoshimo, Minamitane Town, Kumage District, Kagoshima Prefecture	30.3644	130.9011	5	15.VII.2017
13	Maeno-hama Beach, Nakanoshimo, Minamitane Town, Kumage District, Kagoshima Prefecture	30.3641	130.9035	4	15.VII.2017

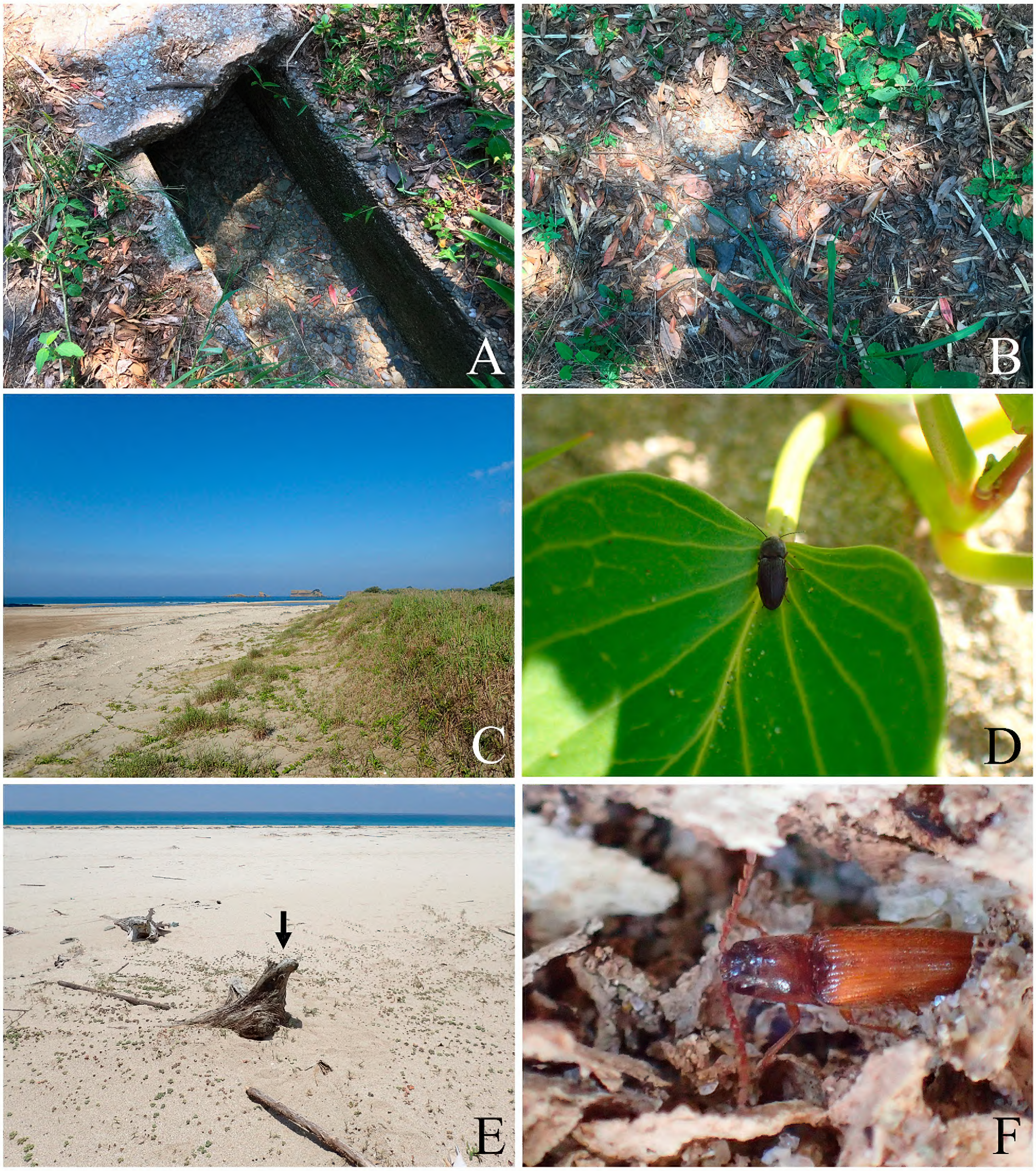

Figure 2. A, B. Site 9. **C, D.** Site 10. **E, F.** Site 13. The site numbers correspond to those of Table 1. **A.** Gutter on the side of a road through cultivated land near the seaside. **B.** Open space beside cultivated land near the seaside. **C.** Sandy beach. **D.** *Paracardiophorus sequens sequens* (Candèze, 1873) on a leaf of *Ipomoea pes-caprae* (family Convolvulaceae). **E.** Sandy beach (arrow: rotting wood). **F.** Male of *Suzukielater babai* (Kishii and Ôhira, 1956) from rotting wood lying on a sandy beach.

An asterisk (*) denotes a new record from the island.

Class Insecta
Order Coleoptera
Superfamily Elateroidea
Family Elateridae
Subfamily Agrypninae Candèze, 1857

Agrypnus (*Agrypnus*) *binodulus binodulus* (Motschulsky, 1861)

Lacon binodulus Motschulsky 1861: 8.
Agrypnus binodulus; Ôhira 1954: 14.
Lacon albomaculatus Miwa 1934: 68.
Material examined. 1♂, Site 2, SLT [18A001] (Fig. 3A).
Species diagnosis. Ôhira (2002a).

Agrypnus (*Sabikikorius*) *fuliginosus* (Candèze, 1865)

Lacon fuliginosus Candèze 1865: 10.
Agrypnus (*Sabikikorius*) *fuliginosus*; Nakane and Kishii 1955c: 3.
Sabikikorius fuliginosus; Kishii 1957: 84.
Adelocera (*Sabikikorius*) *fuliginosus*; Chûjô and Ôhira 1965: 3.

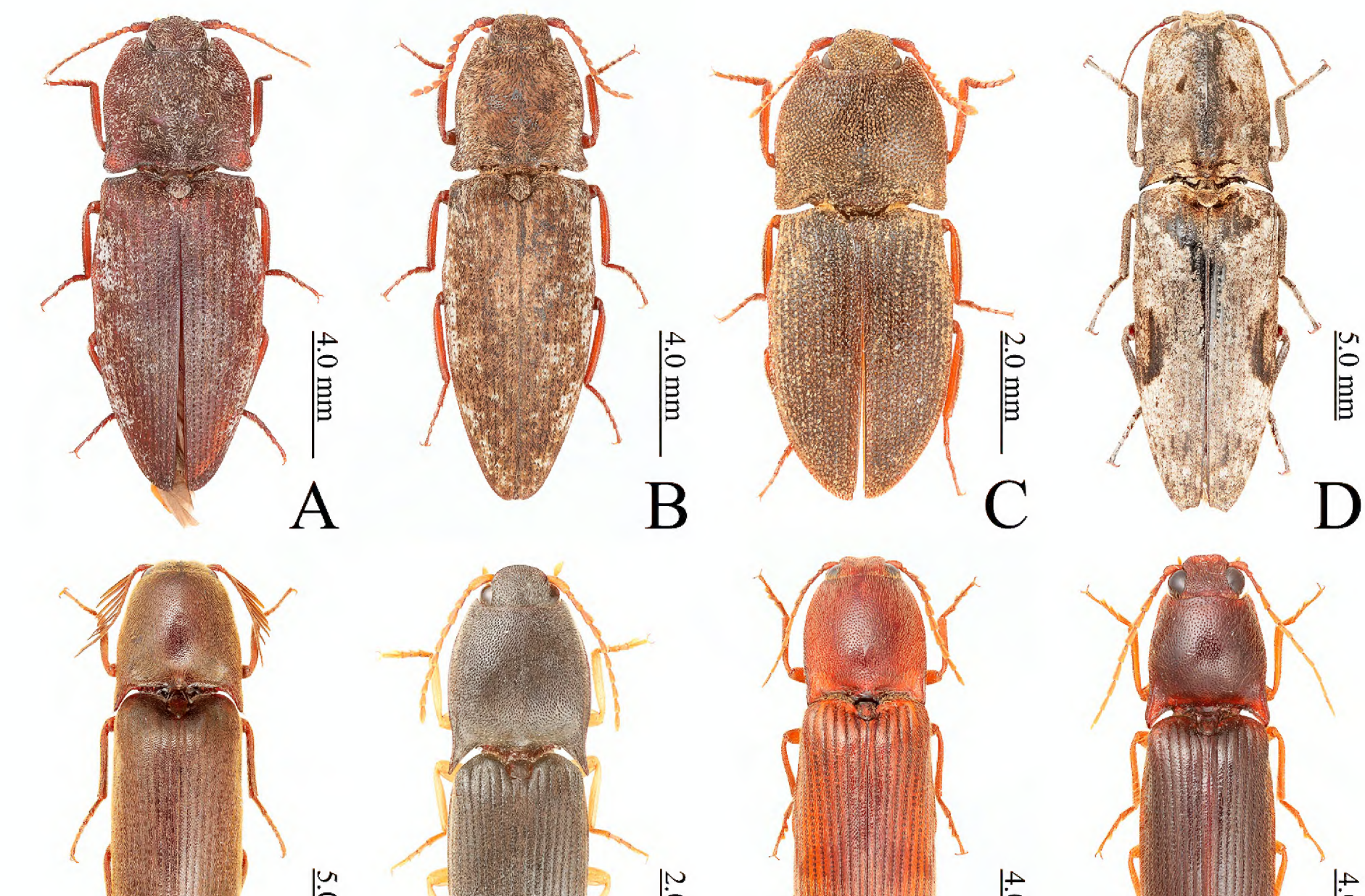

Figure 3. Elaterid species, habitus, dorsal view. **A.** *Agrypnus* (*Agrypnus*) *binodulus binodulus* (Motschulsky, 1861), male [18A001]. **B.** *Agrypnus* (*Sabikikorius*) *fuliginosus* (Candèze, 1865), male [18A002]. **C.** *Agrypnus* (*Colaulon*) *kusuii* Ôhira, 1993, female [18A003], abdomen removed. **D.** *Cryptalaus larvatus pini* (Lewis, 1894), female [18A007]. **E.** *Tetrigus lewisi* Candèze, 1873, male [18A010]. **F.** *Heteroderes changi* Ôhira, 1967, male [18A024]. **G.** *Stenagostus umbratilis* (Lewis, 1894), female [18A028]. **H.** *Megathous suturalis* (Candèze, 1873), male [18A030]. **I.** *Paraphotistus notabilis yagi* Kishii, 1982, male [18A031]. **J.** *Procraerus* (*Agaripenthes*) *helvolus* (Candèze, 1873), male [18A033]. **K.** *Hayekpenthes pallidus pallidus* (Lewis, 1894), male [18A035]. **L.** *Haterumelater bicarinatus yaku* Kishii, 1976, female [18A038].

Material examined. 1♂, Site 2, SLT [18A002] (Fig. 3B).

Species diagnosis. Ôhira (2003a).

**Agrypnus* (*Colaulon*) *kusuii* Ôhira, 1993

Agrypnus (*Colaulon*) *kusuii* Ôhira 1993: 249.

Material examined. 1♀, Site 5, spraying [18A003] (Fig. 3C); 1♂, 1♀, Site 9, spraying [18A004, 18A005]; 1♀, Site 12, looking [18A006].

Species diagnosis. Ôhira (2004).

Remarks. This species was described from Mage Island, located 20 km west of Tanegashima Island, and has been recorded from Yakushima Island and Cape Sata, Kagoshima Prefecture (Ôhira 2004). It is endemic to the area near the Ôsumi Islands.

Bionomics. At Site 9, this species was found in a crack in the gutter on the side of a road through cultivated land near the seaside (Fig. 2A), together with *Heteroderes changi* Ôhira 1967. At Site 12, we observed a specimen walking in the grassland at night.

Cryptalaus larvatus pini (Lewis, 1894)

Alaus pini Lewis 1894: 30.
Alaus putridus pini; Nakane and Kishii 1955a: 15.
Paracalais larvatus pini; Ôhira 1976: 32.
Cryptalaus larvatus pini; Ôhira 1990b: 21.
Alaus putridus satoi Ôhira 1964: 235.
Paracalais putridus satoi; Ôhira 1969c: 25.
Paracalais larvatus satoi; Ôhira and Arimoto 1976: 365.

Material examined. 2♀, Site 2, SLT [18A007, 18A008] (Fig. 3D); 1♀, Site 11, SLT [18A009].

Species diagnosis. Ôhira and Suzuki (1985).

Tetrigus lewisi Candèze, 1873

Tetrigus lewisi Candèze 1873: 6.
Tetrigus grandis Lewis 1879b: 155.

Material examined. 9♂, Site 2, SLT [18A010–18A018] (Fig. 3E); 4♂, 1♀, Site 11, SLT [18A019–18A023].

Species diagnosis. Ôhira and Suzuki (1985).

**Heteroderes changi* Ôhira, 1967

Heteroderes changi Ôhira 1967: 57.

Material examined. 3♂, 1♀, Site 9, spraying [18A024–18A027] (Fig. 3F).

Species diagnosis. Arimoto et al. (2015).

Remarks. This species was recorded from Kagoshima City, Kagoshima Prefecture, Japan by Arimoto et al. (2015) as a non-native species, introduced from Taiwan.

Bionomics. The specimens examined were found in a crack in the gutter on the side of a road through cultivated land near the seaside (Fig. 2A), together with *Agrypnus* (*Colaulon*) *kusuii* Ôhira 1993.

Subfamily Dendrometerinae Gistel, 1848

**Stenagostus umbratilis* (Lewis, 1894)

Athous umbratilis Lewis 1894: 198.
Stenagostus umbratilis; Nakane and Kishii 1955a: 15.
Stenagostus umbratilis var. *obscuratus* Nakane 1958: 86.

Material examined. 2♀, Site 2, SLT [18A028, 18A029] (Fig. 3G).

Species diagnosis. Ôhira and Suzuki (1985).

**Megathous suturalis* (Candèze, 1873)

Athous suturalis Candèze 1873: 23.
Megathous suturalis; Ôhira 2001a: 57.
Harminathous nakanei Kishii 1955: 79.

Material examined. 1♂, Site 2, SLT [18A030] (Fig. 3H).

Species diagnosis. Ôhira (2001a).

**Paraphotistus notabilis yagi* Kishii, 1982

Paraphotistus notabilis yagi Kishii 1982: 39.

Material examined. 2♂, Site 6, Tomoji Mikage leg. [18A031, 18A032] (Fig. 3I).

Species diagnosis. Kishii (1982).

Subfamily Elaterinae Leach, 1815

Procraerus (*Agaripenthes*) *helvolus* (Candèze, 1873)

Agriotes helvolus Candèze 1873: 30.
Procraerus helvolus; Nakane and Kishii 1955c: 5.
Procraerus (*Agaripenthes*) *helvolus*; Ôhira 1970: 84.
Agaripenthes helvolus; Gurjeva 1979: 115.
Megapenthes flavus Fleutiaux 1902: 19.

Material examined. 1♂, Site 2, SLT [18A033]; 1♀, Site 11, SLT [18A034] (Fig. 3J).

Species diagnosis. Ôhira (1998b).

Remarks. The status of *Agaripenthes* Ôhira, 1970 is not stable. Ôhira (1970, 1998b) assigned *Agaripenthes* to the subgenus status, while Kishii (1999, 2006) assigned it generic status. Herein, we follow the proposed of Ôhira (1970, 1998b).

**Hayekpenthes pallidus pallidus* (Lewis, 1894)

Megapenthes pallidus Lewis 1894: 46.
Pengamethes pallidus; Miwa 1933: 70.
Ganoxanthus pallidus; Nakane and Kishii 1955d: 208.
Hayekpenthes pallidus; Ôhira 1970: 87.
Hayekpenthes pallidus pallidus; Ôhira 1998c: 11.

Material examined. 2♂, 1♀, Site 2, SLT [18A035–18A037] (Fig. 3K).

Species diagnosis. Ôhira (1998c).

Haterumelater bicarinatus yaku Kishii, 1976

Haterumelater bicarinatus yaku Kishii 1976b: 49.

Material examined. 2♀, Site 13, picking up from rotting wood [18A038, 18A039] (Fig. 3L).

Species diagnosis. Ôhira (2005).

Bionomics. The specimens examined were collected from rotting wood on a sandy beach (Fig. 2E), together with *Suzukielater babai* Kishii & Ôhira, 1956.

Ampedus (*Ampedus*) *japonicus japonicus* Silfverberg, 1977

Elater rufipes Lewis 1894: 40.
Ampedus japonicus Silfverberg 1977: 92.

Material examined. 1♀, Site 7, Kazue Ito leg. [18A040] (Fig. 4A).

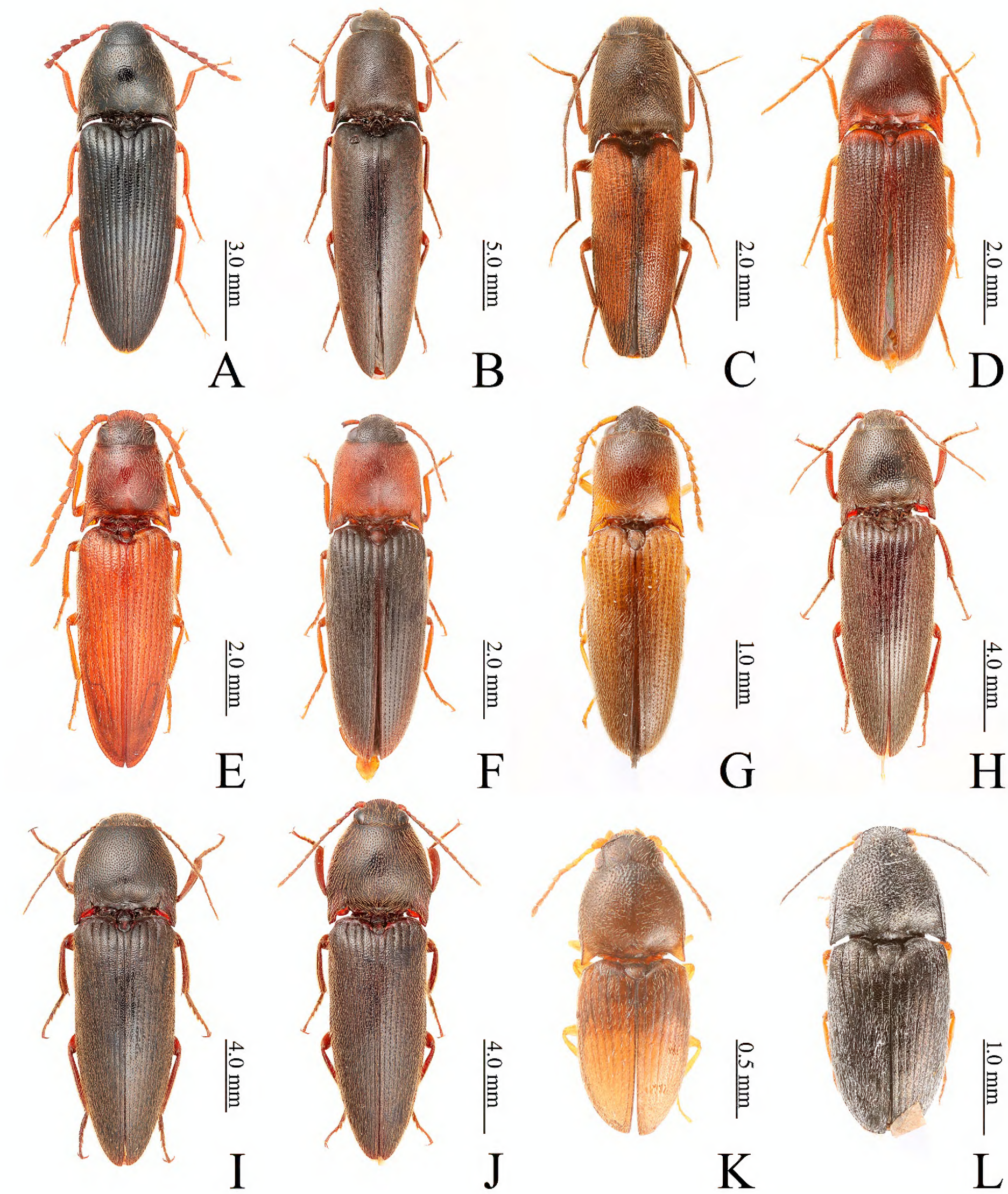

Figure 4. Elaterid species, habitus, dorsal view. **A.** *Ampedus* (*Ampedus*) *japonicus japonicus* Silfverberg, 1977, female [18A040]. **B.** *Nipponoelater sieboldi sieboldi* (Candèze, 1873), male [18A041]. **C.** *Mulsanteus linteatus linteatus* (Candèze, 1873), male [18A052]. **D.** *Podeonius aquilus ryukyuensis* (Ôhira, 1968), male [18A053]. **E.** *Suzukielater babai* (Kishii and Ôhira, 1956), male [18A062]. **F.** *Parasilesis musculus musculus* (Candèze, 1873), female [18A121]. **G.** *Glyphonyx bicolor bicolor* Candèze, 1893, male [18A122]. **H.** *Melanotus* (*Melanotus*) *legatus ogatai* Kishii, 1988, female [18A123]. **I.** *Melanotus* (*Melanotus*) *lewisi lewisi* Schenkling, 1927, male [18A129]. **J.** *Melanotus* (*Melanotus*) *legatoides* Kishii, 1975, male [18A264]. **K.** *Zorochros* (*Pronegastrius) humeralis yakuensis* (Kishii, 1976), female [18A266], abdomen removed. **L.** *Zorochros* (*Yamatostrius*) *osawai* (Ôhira, 1972), male [18A267].

Species diagnosis. Ôhira and Suzuki (1985).

Remarks. Silfverberg (1977) stated that *Elater rufipes* Lewis, 1894 was a junior homonym of *Elater rufipes* Goeze, 1777 and proposed *Ampedus japonicus* as a replacement name.

**Nipponoelater sieboldi sieboldi* (Candèze, 1873)

Ludius sieboldi Candèze 1873: 27.
Orthostehus sieboldi sieboldi; Ôhira 1997b: 37.
Nipponoelater sieboldi sieboldi; Kishii 1998: 3.
Aphanobius unicolor Fleutiaux 1900: 357.

Material examined. 10♂, 1♀, Site 2, SLT [18A041–18A051] (Fig. 4B).

Species diagnosis. Ôhira (1997b).

Mulsanteus linteatus linteatus (Candèze, 1873)

Ludis linteatus Candèze 1873: 28.
Neotrichophorus linteatus linteatus; Ôhira 1998a: 24.
Mulsanteus linteatus linteatus; Kishii 1999: 81.
Ludius ligatus Candèze 1891: 190.
Neotrichophorus aureopilosus yamamotoi Nakane and Kishii 1955b: 44.

Material examined. 1♂, Site 3, looking [18A052] (Fig. 4C).

Species diagnosis. Ôhira (1998a).

Bionomics. The specimen examined was found on a leaf of grass in open land near a forest.

Podeonius aquilus ryukyuensis (Ôhira, 1968)

Anchastus aquilus ryukyuensis Ôhira 1968: 134.
Akitsu aquilus ryukyuensis; Kishii 1999: 72.
Podeonius aquilus ryukyuensis; Ôhira 2003b: 20.

Material examined. 3♂, 1♀, Site 2, SLT [18A053–18A056] (Fig. 4D); 3♂, 1♀, Site 11, SLT [18A057–18A060].

Species diagnosis. Ôhira (1996b).

**Suzukielater babai* (Kishii & Ôhira, 1956)

Sphenimerus babai Kishii and Ôhira 1956: 82.
Suzukielater babai; Kishii 1987: 10.

Material examined. 1♂, Site11, SLT [18A061]; 50♂, 9♀, Site 13, looking and picking up from rotting wood [18A062–18A120] (Fig. 4E).

Species diagnosis. Ôhira (2001b).

Remarks. *Suzukielater babai* has been recorded from 11 locations in Japan (Ôhira 2002b, Kido 2004, Ozaki et al. 2006). Tanegashima Island is the twelfth collecting locality of this species. This species was found only twice on the Pacific coast side of Japan (Ôhira 2002b, Kido 2004, Kido and Oda 2004).

Ôhira (2001b) mentioned a record of this species from "Iki Island, Fukuoka Prefecture", referring to Miyata et al. (1977). In fact, Miyata et al. (1977) recorded this species from "Okinoshima Island, Fukuoka Prefecture", and Iki Island is in Nagasaki Prefecture. Ôhira (2002b) revised the mention in Ôhira (2001b) as from "Okinoshima Island, Fukuoka Prefecture". Kido (2004) stated that there is a record of this species from Iki Island, but his statement seemed to be based on the error in Ôhira (2001b).

Bionomics. At Site 13, some adults and larvae were found in rotting wood lying on a sandy beach (Fig. 2E, F). Many adults were found at night on the surface of rotting wood on the same beach. We will report the details of the ecology and morphology of this species in another paper.

Parasilesis musculus musculus (Candèze, 1873)

Silesis musculus Candèze 1873: 31.
Silesis musculus var. *flavipennis* Lewis 1894: 315.
Silesis musculus var. *flavicollis* Fleutiaux 1902: 23.
Parasilesis musculus; Ôhira 1990a: 75.
Agriotes ferrugineipennis Motschulsky 1866: 166.
Agriotes candezei Lewis 1879a: 16.
Dalopius candezei; Miwa 1928: 49.
Silesis crocatus Candèze 1893: 68.
Silesis harmandi Fleutiaux 1900: 358.

Material examined. 1♀, Site 2, SLT [18A121] (Fig. 4F).

Species diagnosis. Ôhira (1988).

Remarks. Because *Agriotes ferrugineipennis* Motschulsky, 1866 is a junior homonym of *Agriotes ferrugineipennis* LeConte, 1861, Lewis (1879a) proposed *Agriotes candezei* as a replacement name. Ôhira (1969a) synonymized *Agriotes candezei* with *Silesis musculus* var. *flavipennis* Lewis, 1894.

Ôhira (1990a) compared *Silesis musculus* with *Silesis hilaris* Candèze, 1863, the type species of the genus *Silesis* Candèze, 1863, and established the genus *Parasilesis* based on *S. musculus*. Kishii (1999) synonymized *Parasilesis* with *Silesis*, but that publication is just a checklist of the Japanese elaterid beetles and does not contain any evidence or discussion. In this study, we follow the treatment of Ôhira (1990a).

This species exhibits variation of pronotum color, which can be black or red (Ôhira 1996a). The specimen examined had the reddish pronotal type.

**Glyphonyx bicolor bicolor* Candèze, 1893

Glyphonyx bicolor Candèze 1893: 66.

Material examined. 1♂, Site 2, SLT [18A122] (Fig. 4G).

Species diagnosis. Ôhira (2002c)

Subfamily Melanotinae Candèze, 1859

Melanotus (*Melanotus*) *legatus ogatai* Kishii, 1988

Melanotus (*Melanotus*) *legatus ogatai* Kishii 1988: 124.
Melanotus (*Melanotus*) *akusekianus* Ôhira 1997c: 346.

Material examined. 6♀, Site 11, SLT [18A123–18A128] (Fig. 4H).

Species diagnosis. Kishii (1988).

**Melanotus* (*Melanotus*) *lewisi lewisi* Schenkling, 1927

Melanotus longipennis Lewis 1894: 192.
Melanotus lewisi Schenkling 1927: 277.

Material examined. 128♂, 5♀, Site 2, SLT [18A129–18A262] (Fig. 4I); 1♀, Site 11, SLT [18A263].

Species diagnosis. Kishii (1986).

Remarks. Schenkling (1927) stated that *Melanotus longipennis* Lewis, 1894 was a junior homonym of *Cratony-*

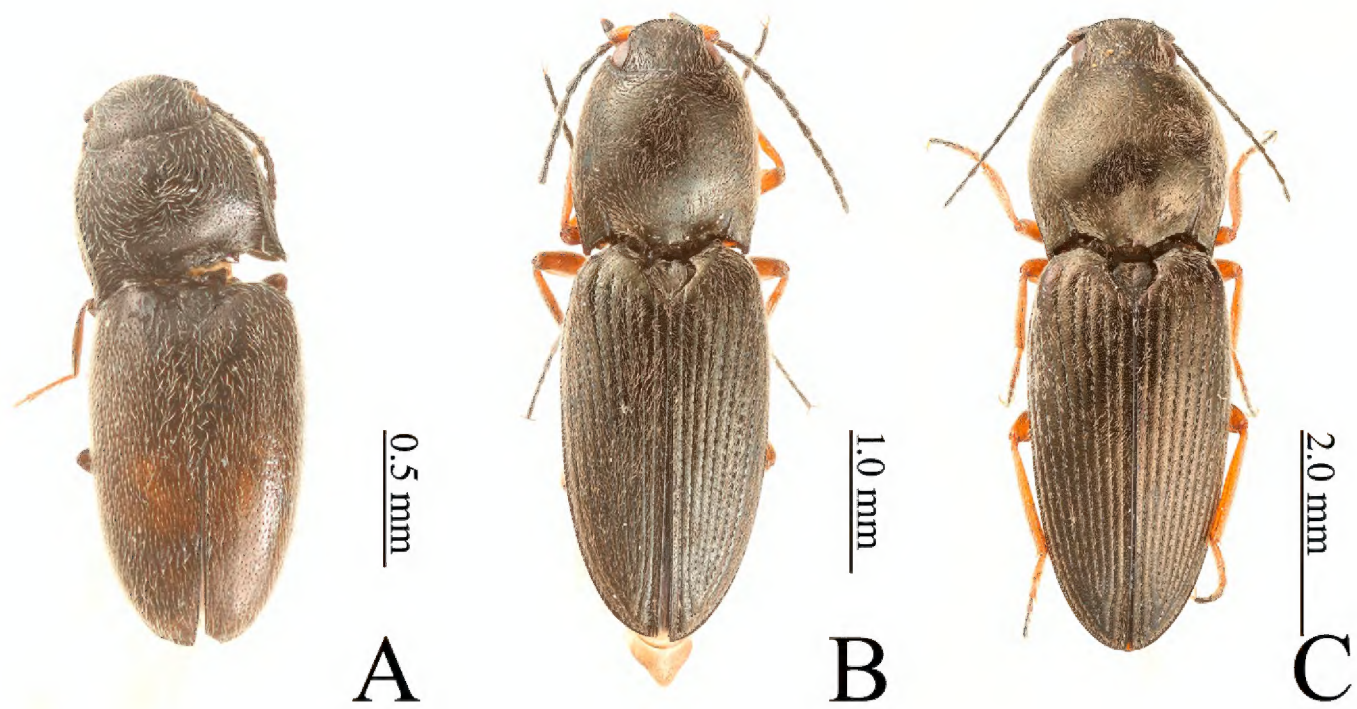

Figure 5. Elaterid species, habitus, dorsal view. **A.** *Quasimus uguriensis heianus* Kishii, 1970, female [18A272], abdomen removed. **B.** *Paracardiophorus pullatus pullatus* (Candèze, 1873), male [18A273]. **C.** *Paracardiophorus sequens sequens* (Candèze, 1873), female [18A312].

chus longipennis Küster, 1848 (=*Melanotus longipennis*) and proposed *Melanotus lewisi* as a replacement name.

**Melanotus* (*Melanotus*) *legatoides* Kishii, 1975

Melanotus (*Melanotus*) *legatoides* Kishii 1975: 5.

Material examined. 2♂, 1♀, Site 2, SLT [18A264, 18A265] (Fig. 4J).

Species diagnosis. Kishii (1975).

Subfamily Negastriinae Nakane & Kishii, 1956

**Zorochros* (*Pronegastrius*) *humeralis yakuensis* (Kishii, 1976)

Negastrius humeralis (Candèze, 1873); Nakane and Kishii 1958: 36.
Pronegastrius (*Pronegastrius*) *humeralis yakuensis* Kishii 1976a: 29.
Zorochros (*Pronegastrius*) *humeralis yakuensis*; Kishii 1999: 105.

Material examined. 1♀, Site 8, spraying [18A266] (Fig. 4K).

Species diagnosis. Kishii (1976a).

Remarks. Nakane and Kishii (1958) recorded *Negastrius humeralis* (Candèze, 1873) from Yakushima Island for the first time. Kishii (1976a) described *Pronegastrius* (*Pronegastrius*) *humeralis yakuensis* based on specimens from Yakushima Island and assigned the *Negastrius humeralis* population from Yakushima Island to the subspecies name.

Bionomics. The specimen examined was found under a stone near the mouth of a river, together with *Quasimus uguriensis heianus* Kishii, 1970.

Zorochros (*Yamatostrius*) *osawai* (Ôhira, 1972)

Negastrius osawai Ôhira 1972: 20.
Monadicus (*Yamatostrius*) *osawai*; Kishii 1976a: 27.
Zorochros (*Yamatostrius*) *osawai*; Kishii 1999: 105.

Material examined. 3♂, 2♀, Site 13, looking and spraying [18A267–18A271] (Fig. 4L).

Species diagnosis. Kishii (1976a).

Bionomics. The specimens examined were collected under rotting wood (Fig. 2E), where *Suzukielater babai* was found, together with *Paracardiophorus sequens sequens* (Candèze, 1873).

** Quasimus uguriensis heianus* Kishii, 1970

Quasimus (*Quasimus*) *heianus* Kishii 1970: 25.
Quasimus (*Quasimus*) *uguriensis heianus* Kishii 1970: 24.
Quasimus uguriensis heianus; Kishii 1999: 109.

Material examined. 1♀, Site 8, spraying [18A272] (Fig. 5A).

Species diagnosis. Kishii (1970).

Remarks. *Quasimus uguriensis* was divided into 3 subspecies: *Quasimus uguriensis uguriensis* Kishii, 1970 from Uguru Island, Shikoku; *Q. uguriensis okicola* Kishii, 1970 from Okinoshima Island, Shikoku; and *Q. uguriensis heianus* from Kuchinoerabu Island, in the Ôsumi Islands. The 3 subspecies are similar in the shape of the male aedeagus, but differ in the hind angle of the prothorax, scutellum, and metasternum (Kishii 1976a). The specimen examined is similar to the specimens of the type series of *Quasimus uguriensis heianus* in the shape of the scutellum (Kishii 1970) and differs from the type series by the sinuate hind angle of the prothorax and the carina of the metasternum obscure posteriorly. There are no detailed studies of morphological variation either among allopatric populations or among sympatric specimens because there are few records of this species. Future efforts to collect more specimens are needed to understand the morphological variation of this species. In this study, we determined that the specimens examined were *Q. uguriensis heianus* based on similar scutellum and its distribution.

Bionomics. The specimen examined was collected under a stone near the mouth of a river, together with *Zorochros* (*Pronegastrius*) *humeralis yakuensis* (Kishii 1976a).

Subfamily Cardiophorinae Candèze, 1859

***Paracardiophorus pullatus pullatus* (Candèze, 1873)**

Cardiophorus pullatus Candèze 1873: 16.
Paracardiophorus pullatus; Schwarz 1895: 39.
Paracardiophorus pullatus pullatus; Ôhira 1997a: 3.
Paracardiophorus subaeneus Fleutiaux 1902; Ôhira 1986: 36 [misidentification].

Material examined. 3♂, 1♀, Site 9, looking and spraying [18A273–18A276] (Fig. 5B).

Species diagnosis. Ôhira (1997a).

Remarks. Ôhira (1969a) synonymized *Cardiophorus subaeneus* Fleutiaux, 1902 (=*Paracardiophorus subaeneus*) with *Paracardiophorus sequens sequens* (Candèze, 1873), but later, Ôhira (1986) revalidated *P. subaeneus*. However, Ôhira (1997a) stated that the specimen that was identified as *P. subaeneus* by Ôhira (1986) was actually *Paracardiophorus pullatus pullatus* (Candèze, 1873) and concluded that *P. subaeneus* was a junior synonym of *P. sequens*.

Paracardiophorus pullatus pullatus exhibits variation in leg coloration, which can be black or yellow. The legs of 1 of the specimens examined were black, while those of the remaining 3 specimens were yellow.

Bionomics. The specimens examined were found in the spaces between small stones in the open space beside cultivated land near the seaside (Fig. 2B).

***Paracardiophorus sequens sequens* (Candèze, 1873)**

Cardiophorus sequens Candèze 1873: 16.
Paracardiophorus sequens; Schwarz 1895: 39.
Paracardiophorus sequens sequens; Ôhira 1997a: 3.
Cardiophorus subaeneus Fleutiaux 1902: 20.

Material examined. 21♂, 13♀, Site 1, spraying [18A277–18A310]; 1♀, Site 4, spraying [18A311]; 3♀, Site 8, spraying [18A312–18A314] (Fig. 5C); 24♂, 9♀, Site 10, looking [18A315–18A347]; 3♂, 2♀, Site 13, looking and spraying [18A348–18A352].

Species diagnosis. Ôhira (1997a)

Bionomics. At Site 10 (Fig. 2C), we observed, during the day, 32 specimens of *Paracardiophorus sequens* in 30 min, on leaves of *Ipomoea pes-caprae* (family Convolvulaceae) on a sandy beach. The insects did not move from the leaves during our observations. We also found one specimen of the false blister beetle *Asessinia flavomarginata* (Miyatake, 1985) and some Diptera and Hymenoptera. The Diptera and Hymenoptera specimens were observed flying actively and landing on leaves briefly. Only *P. sequens* seemed to occupy the leaves of *I. pes-caprae*. Each *I. pes-caprae* leave is typically folded at the mid-vein. Most of the specimens of *P. sequens* stayed in the shadow at the mid-vein thrown by the fold (Fig. 2D). Several specimens held onto stems. Usually, *Paracardiophorus* species tend to hide under or between stones (Arimoto 2014), while *P. sequens* hides near the roots of grasses or just under the surface of sandy ground on beaches where there are few stones (Arimoto 2016). We postulate therefore that this behavior helps the beetles to avoid the heat of the sand on the beach under the blazing sun.

At Site 13, *P. sequens* was collected under rotting wood (Fig. 2E), where *Suzukielater babai* was found, together with *Zorochros* (*Yamatostrius*) *osawai* (Ôhira, 1972).

Discussion

Hirashima (1989) and Kishii (1999) did not confirm *Haterumelater bicarinatus yaku* Kishii, 1976 from Tanegashima Island. Kishii (1976b) had already recorded a male of *H. bicarinatus* from the island, although he did not specify which subspecies. Ôhira (1976) recorded the subspecies as the nominotypical subspecies. Ôhira (2005) subsequently changed the subspecies name to *H. bicarinatus yaku*.

Ôtsubo (2013) treated 8 species as new records from Tanegashima Island, but 4 of them [*H. bicarinatus yaku*, *Ampedus* (*Ampedus*) *japonicus japonicus* Silfverberg, 1977, *Ampedus* (*Ampedus*) *vestitus vestitus* (Lewis, 1894), and *Melanotus* (*Melanotus*) *senilis senilis* Candèze, 1865] had been recorded already by Kishii (1976b) or Ôhira (2000). Moreover, Ôtsubo (2013) confused the correspondences between the Japanese and scientific names of *A.* (*A.*) *vestitus vestitus*, *Melanotus* (*M.*) *correctus correctus* Candèze, 1865, and *M.* (*M.*) *senilis senilis*. We assumed that he intended the Japanese names because the paper was written in Japanese, except for the scientific names.

We confirmed a total of 43 elaterid species from Tanegashima Island, including 13 newly recorded species (Table 2). There is no endemic species or subspecies from this Island. Thirty-nine species (90.7% of those from Tanegashima Island) are also distributed on Yakushima Island, which is located 18 km west of Tanegashima Island.

The Ôsumi Islands are the southern limit of the distribution of about 50 elaterid species (Arimoto unpublished data), and Yakushima Island is the southern limit of the distribution for almost all of them because Yakushima Island is located at south of Tanegashima Island. As result, Tanegashima Island is the southern limit of the distribution of only 3 species [*Meristhus* (*Sulcimerus*) *niponensis* Lewis, 1894; *Parasilesis musculus musculus* Candèze, 1873; and *Glyphonyx illepidus* Candèze, 1873]. Ôtsubo (2013) recognized Tanegashima Island as the southern limit of the distribution of *Ectinoides insignitus insignitus* (Lewis, 1894), although the correct southern limit is Yakushima Island (Kishii 1999). Tanegashima Island is not the northern limit of the distribution of any elaterid species.

The elaterid fauna of Tanegashima Island has been characterized by the absence of species in elevated land or riversides until this study. A lack of research may have resulted in the absence of records from riverside species because we found 2 species under stones by a river: *Quasimus uguriensis heianus* and *Zorochros* (*Pronegastrius*) *humeralis yakuensis*.

Table 2. Checklist of species of the family Elateridae in Tanagashima Island, Japan. Asterisk (*) denotes new record from Tanegashima Island, dagger (†) denotes Tanegashima Island as the southern limit of the species distribution, hash (#) denotes non-native species from Taiwan, and section make (§) denotes sharing species with the elaterid fauna of Yakushima Island, which is located 18 km west of Tanegashima Island.

No.	Species name	Remarks
1	*Meristhus* (*Sulcimerus*) *niponensis* Lewis, 1894	†
2	*Agrypnus* (*Agrypnus*) *binodulus binodulus* (Motschulsky, 1861)	§
3	*Agrypnus* (*Sabikikorius*) *fuliginosus* (Candèze, 1865)	§
4	*Agrypnus* (*Colaulon*) *tsukamotoi* (Kishii, 1956)	§
5	*Agrypnus* (*Colaulon*) *kusuii* Ôhira, 1993	*, §
6	*Cryptalaus berus* (Candèze, 1865)	§
7	*Cryptalaus larvatus pini* (Lewis, 1894)	§
8	*Tetrigus lewisi* Candèze, 1873	§
9	*Prodrasterius agnates* (Candèze, 1873)	§
10	*Aeoloderma brachmana* (Candèze, 1859)	§
11	*Heteroderes changi* Ôhira, 1967	*, #
12	*Stenagostus umbratilis* (Lewis, 1894)	*, §
13	*Megathous suturalis* (Candèze, 1873)	*, §
14	*Hemicrepidius* (*Hemicrepidius*) *secessus secessus* (Candèze, 1873)	§
15	*Paraphotistus notabilis yagi* Kishii, 1982	*, §
16	*Ischiodontus kawaii* Ôhira, 1967	§
17	*Procraerus* (*Agaripenthes*) *helvolus* (Candèze, 1873)	§
18	*Hayekpenthes pallidus pallidus* (Lewis, 1894)	*, §
19	*Haterumelater bicarinatus yaku* Kishii, 1976	§
20	*Ampedus* (*Ampedus*) *japonicas japonicas* Silfverberg, 1977	§
21	*Ampedus* (*Ampedus*) *vestitus vestitus* (Lewis, 1894)	§
22	*Podeonius aquilus ryukyuensis* (Ôhira, 1968)	§
23	*Nipponoelater sieboldi sieboldi* (Candèze, 1873)	*, §
24	*Mulsanteus junior junior* (Candèze, 1873)	§
25	*Mulsanteus linteatus linteatus* (Candèze, 1873)	*, §
26	*Suzukielater babai* (Kishii & Ohira, 1956)	*, §
27	*Ectinoides insignitus insignitus* (Lewis, 1894)	§
28	*Parasilesis musculus musculus* Candèze, 1873	†
29	*Glyphonyx illepidus* Candèze, 1873	†
30	*Glyphonyx bicolor bicolor* Candèze, 1893	*, §
31	*Melanotus* (*Melanotus*) *legatus ogatai* Kishii, 1988	§
32	*Melanotus* (*Melanotus*) *lewisi lewisi* Schenkling, 1927	*, §
33	*Melanotus* (*Melanotus*) *legatoides* Kishii, 1975	*, §
34	*Melanotus* (*Melanotus*) *correctus correctus* Candèze, 1865	§
35	*Melanotus* (*Melanotus*) *senilis senilis* Candèze, 1865	§
36	*Melanotus* (*Melanotus*) *satoi* Ôhira, 1967	§
37	*Melanotus* (*Spheniscosomus*) *cete cete* Candèze, 1860	§
38	*Zorochros* (*Yamatostrius*) *osawai* (Ôhira, 1972)	§
39	*Zorochros* (*Pronegastrius*) *humeralis yakuensis* (Kishii, 1976)	*, §
40	*Quasimus uguriensis heianus* Kishii, 1970	*, §
41	*Platynychus nothus* (Candèze, 1865)	§
42	*Paracardiophorus pullatus pullatus* (Candèze, 1873)	§
43	*Paracardiophorus sequens sequens* (Candèze, 1873)	§

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Authors' Contributions

KA identified specimens, made the map, wrote the text, and took photographs. KA and RI collected the specimens.

References

Arimoto K (2014) Records and habitats of three elaterid beetles from seaside in Okinawa-jima Island. Sayabane, new series 16: 38–39. (In Japanese)

Arimoto K, Tsukada T, Arimoto H (2015) Review of the genus *Heteroderes* Latreille in Japan (Coleoptera: Elateridae: Agrypninae). Japanese Journal of Systematic Entomology 21 (2): 345–350.

Arimoto K (2016) Contrasting activity of two seaside elaterid species. Sayabane, new series 23: 23–24. (In Japanese)

Candèze ECA (1865) Èlatérides nouveaux. I. Mémoires Couronnès et autres Mèmories. Acadèmie Royale de Sciences, de Lettres et des Beaux-Arts de Belgique. (Classe Science) 17 (1): 1–63.

Candèze ECA (1873) Insects recueillis au Japon par Mr. G. Lewis. Èlatérides. *Mémoires de la Société Royale des Sciences de Liège* (2) 5: 1–32.

Candèze ECA (1891) Catalogue méthodique des élatérides connus en 1890. Imprimerie H. Vaillant-Carmanne, Liège, xii + 246 pp.

Candèze ECA (1893) Èlatérides nouveaux V. Mémoires de la Société Royale des Sciences de Liège 18: 1–76.

Chûjô, M (1973) Studies on the classification and zoogeographical distribution of the family Elateridae (Insecta-Coleoptera) from the Loo-Choo (Ryukyu) Archipelago (including Satsunan Islands). Coleoptera of Loo-Choo Archipelago (V). Memoirs of the Faculty of Edcation, Kagawa University, part 2, 218: 17–41. (In Japanese.)

Chûjô M, Ôhira H (1965) Elaterid-beetles from Aomori Pref., Japan, collected by Mr. Kensaku Shimoyama. Memories of the faculty of Liberal arts and Education Kagawa University, Part II, 132: 1–32. (In Japanese, with English title and abstract)

Fleutiaux E (1900) Liste des Cicindelidae, Elateridae et Eucnemidae recuellis dans le Japon central par M. le Dr. J. Harmand de 1894 à 1897. Bulletin du Muséum d'Historie naturelle Paris 6: 356–361.

Fleutiaux E (1902) Deuxième liste des Cicindelidae, Elateridae et Melasidae (Eucnemidae), recueillis au Japon par M. J. Harmand. Bulletin du Muséum d'Histoire naturelle Paris 8: 18–25.

Geospatial Information Authority of Japan (2018) http://www.gsi.go.jp/KOKUJYOHO/MENCHO/201610/f3_shima.pdf. Accessed on: 2018-1-30. (In Japanese)

Gurjeva EL (1979) Zhuki-shchelkuny (Elateridae). Podesemejstvo Elaterinae, Triby Megapenthini, Physorhinini, Ampedini, Elaterini, Pomachiliini. In: Fauna USSR. Novaya seriya, 118. Zhestkokrylye. Vol. 12 (4). Izdatel"stvo "Nauka", Leningrad, 452 pp. (In Russian)

Hirashima Y (supervisor) (1989) A checklist of Japanese insects (Entomological laboratory, Faculty of Agriculture, Kyushu University and Japan Wild life research center, eds.). Entomological laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, 1767 pp.

Kido K (2004) Records of three elaterid beetles from a seaside on the Ôshimi Peninsula, Kagoshima Prefecture. Gekkan-Mushi 406: 4. (In Japanese)

Kido K, Oda M (2004) Coleoptera from coastal sand dune in Ôsumi Peninsular, Kagoshima Prefecture. Korasana 72: 26–29. (In Japanese)

Kishii T (1955) Some new forms of Elateridae in Japan. I. Akitu (Transactions of the Kyoto Entomological Society) 4: 77–82.

Kishii T (1957) (II) Elateridae of Nachi, Japan, with description of a new species (Coleoptera). Akitu (Transactions of the Kyoto Entomological Society) 6: 84–89.

Kishii T (1970) On the genus *Yukoana* and *Quasimus* from Japan. Some new forms of Elateridae in Japan (VII). Bulletin of the Heian High School 15: 1–28.
Kishii T (1975) Some new forms of Elateridae in Japan (VIII). Bulletin of the Heian High School 19: 1–7, pls 1, 2.
Kishii T (1976a) New Negastriinae with some notes. Some new forms of Elateridae in Japan (X). Bulletin of the Heian High School 20: 17–46, pls 1–6, table.
Kishii T (1976b) Some new forms of Elateridae in Japan (XI). Bulletin of the Heian High School 20: 47–56, pls 1–5.
Kishii T (1982) New species and new records of Elateridae from Japan (Coleoptera). Some new forms of Elateridae in Japan (XVI). Bulletin of the Heian High School 25: 17–25, pls 1–4.
Kishii T (1986) Some new forms of Elateridae in Japan (XVIII). Bulletin of the Heian High School 30: 37–56, pls 1, 2.
Kishii T (1987) Some new forms of Elateridae in Japan (XIX). Bulletin of the Heian High School 31: 1–20, pl. 1.
Kishii T (1988) Some click-beetles from the Nansei Islands collected by Mr. T. Ogata (Coleoptera: Elateridae). Notes on Elateridae from Japan and its adjacent area (7). Entomological Review of Japan 22 (2): 123–134.
Kishii T (1998) Elaterida beetles of Mie prefecture (3). Nejirebane 80: 1–6. (In Japanese)
Kishii T (1999) A check-list of the family Elateridae from Japan (Coleoptera). Bulletin of the Heian High School 42: 1–144.
Kishii T (2006) Elaterid-beetles (Elateridae, Coleoptera) collected by Mr. Koji Hosokawa from Japan. Regional Natural History of Coleoptera, No. 2, the Japan Coleopterological Society, Osaka, 89 pp.
Kishii T, Ôhira H (1956) Snappers of Niigata Prefecture, especially on the collection by Dr. Kintaro Baba, with the descriptions of some new forms. Akitu (Transactions of the Kyoto Entomological Society) 5 (3): 71–84. (In Japanese, with English summary)
Kyushu Regional Forest Office (2018). http://www.rinya.maff.go.jp/kyusyu/fukyu/hogorin/tanegashima.html. Accessed on: 2018-1-30. (In Japanese)
Lewis G (1879a) A catalogue of Coleoptera from the Japanese archipelago. Taylor & Francis, London, 31 pp.
Lewis G (1879b) Diagnoses of Elateridae from Japan. The Entomologist's Monthly Magazine 16: 155–157.
Lewis G (1894) On the Elateridae of Japan. The Annals and Magazine of Natural History (series 6) 13: 26–48, 182–201, 255–266, 311–320.
Miwa Y (1928) New and some rare species of Elateridae from the Japan Empire. Insecta Matsumurana 3 (1): 36–51.
Miwa Y (1933) Elateridae in the collection of the Entomological Laboratory, Kyushu Imperial University (II). Mushi 6 (2): 66–73. (In Japanese, with English title and description)
Miwa Y (1934) The fauna of Elateridae in the Japanese Empire. Report of the Department of Agriculture, Government Research Institute, Formosa, Japan. 65, 1–289.
Miyata A, Mogi M, Setoya K, Yamamoto S (1977) Checklist of insects in Chikuzen Okinoshima Island. In: The Nagasaki Biological Society (Ed.) Natural History of the Island of Iki, 561–594. (In Japanese)
Motschulsky V de (1861) II Entomologie spéciale. Insectes du Japon, énumérés. Etudes entomologiques 9: 4–27.
Motschulsky V de (1866) Catalogue des insectes recus du Japon. Bulletin de la Société impérial des naturalistes de Moscou 39: 163–200.
Nakane T (1958) On the Coleoptera of Shimokita Peninsula, northern end of Honshu, Japan (Insecta) I. Miscellaneous Reports of the Research Institute for Natural Resources 46/47: 86–87. (In Japanese, with English title and summary)
Nakane T, Kishii T (1955a) Elateridae. In: The Kinki Coleopterological Society (Ed.) Coloured Illustrations of the Insects of Japan. Coleoptera. Osaka, Hoikusha, 12–15. (In Japanese, with English title)
Nakane T, Kishii T (1955b) Descriptions of a few new forms of the elaterid-beetles from Japan, with notes on some others. Scientific reports of the Saikyo University (Natural Science and Living Science) 2 (1): 43–45.
Nakane T, Kishii T (1955c) Entomological results from the scientific survey of the Tokara Islands. I Coleoptera: Elateridae. Bulletin of the Osaka Municipal Museum of Natural History 2: 1–8, pls 1, 2.
Nakane T, Kishii T (1955d) Elateridae. In: The Kinki Coleopterological Society (Ed.) Colored Illustration of the Insects of Japan. Coleoptera. Enlarged and Revised Edition. Osaka, Hoikusha, 82–84, 207–210. (In Japanese, with English title)
Nakane T, Kishii T (1958) The Coleoptera of Yakushima Island, Elateridae. Scientific Reports of the Saikyo University (Natural Science and Living Science), Kyoto 2 (5), A Series: 34–42, pls 1–6, table.
Ôba Y, Ôhira H, Murase Y, Moriyama A, Kumazawa Y (2015) DNA barcoding of Japanese click beetles (Coleoptera, Elateridae). PLoS ONE 10 (1): e0116612. https://doi.org/10.1371/journal.pone.0116612
Ôhira H (1954) Notes on some species of Elateridae from Shikoku. Gensei 3(1/2): 13–18. (In Japanese, with English title)
Ôhira H (1964) New or little-known Elateridae from Japan, VII (Coleoptera). Kontyû 32 (2): 233–235.
Ôhira H (1967) Notes on some elaterid beetles from Formosa IV. Kontyû 35 (1): 55–59.
Ôhira H (1968) The Elateridae of the Ryukyu archipelago, V. Kontyû 36 (2): 134–143.
Ôhira H (1969a) Notes on some elaterid-beetles from Japan (Coleoptera) (II). New Entomologist 18 (2): 19–24. (In Japanese, with English title and summary)
Ôhira H (1969b) Notes on some elaterid-beetles from Japan (Coleoptera) (IV). Kontyû 37 (2): 251–256. (In Japanese, with English title and summary)
Ôhira H (1969c) Elateridae in Japan (II). Nature and Insects 4 (11): 25–31. (In Japanese)
Ôhira H (1970) Notes on some elaterid-beetles from Japan (Coleoptera) (V). Entomological Review of Japan 22 (2): 75–88, pls 8–11. (In Japanese, with English title and summary)
Ôhira H (1972) New or little-known Elateridae from Japan, XIV (Coleoptera). Bulletin of the Japan Entomological Academy 7 (1): 19–21.
Ôhira H (1976) Miscellaneous notes on the Elateridae of Japan (VII). Nature and Insects 11 (4): 32–33. (In Japanese)
Ôhira H (1986) Notes on some *Paracardiophorus*-species from Japan (Coleoptera: Elateridae). Transactions of Essa Entomological Society 62: 29–38. (In Japanese, with English title)
Ôhira H (1988) Notes on some *Silesis*-species from Japan (Coleoptera: Elateridae). Transactions of Essa Entomological Society 65: 19–29. (In Japanese, with English title)
Ôhira H (1990a) Notes on the genus *Silesis* (Elateridae) from Japan. Entomological Review of Japan 45: 73–75, pl. 7.
Ôhira H (1990b) Notes on the genus *Paracalais* and its allied genera. Gekkan-Mushi 234: 19–21. (In Japanese, with English title and summary)
Ôhira H (1993) New or little-known Elateridae (Coleoptera) from Japan, XXVIII. Elytra 21 (2): 249–254.
Ôhira H (1996a) Some elaterid-beetles from Tanegashima Is. and Tsushima Is. off the coast of Kyushu, Japan. Kita-Kyûshû no Konchû 43 (2): 77–79.
Ôhira H (1996b) Notes on the *Anchastus*-species from Japan (Elateridae, Elaterinae, Physorhinini). Transactions of Essa Entomological Society 76: 1–14. (In Japanese, with English title)
Ôhira H (1997a) Notes on *Paracardiophorus pullatus* and its allied species from Japan (Coleoptera: Elateridae). Miscellaneous Reports of the Hiwa Museum for Natural History 35: 1–16, pls 1–14.
Ôhira H (1997b) Notes on *Orthostethus sieboldii* and its allied species from Japan (Coleoptera, Elateridae). Hibakagaku 182: 37–44, pls 1–5. (In Japanese, with English title and abstract)
Ôhira H (1997c) New or little-known Elateridae (Coleoptera) from Japan, XXXVII. Elytra 25 (2): 343–348.
Ôhira H (1998a) Notes on *Neotrichophorus junior* and its allied species from Japan (Coleoptera: Elateridae). New Entomologist 47 (1, 2):

19–26. (In Japanese, with English title and abstract)
Ôhira H (1998b) Notes on the morphological structure of *Procraerus helvolus* and *Procraerus watanabei* from Japan. Transactions of Essa Entomological Society 77: 13–17. (In Japanese, with English title)
Ôhira H (1998c) Notes on some rare Elateridae from Kyushu (65). Kita-Kyûshû no Konchû 45 (1): 11–12, pl. 4. (In Japanese, with English title)
Ôhira H (2000) Collecting trip on the Elaterid-beetles to Tanega-shima Island in Kyushu, Japan. Kita-Kyûshû no Konchû 47 (2): 97–100, pl. 17. (In Japanese, with English title)
Ôhira H (2001a) Notes on *Megathous suturalis* (Candèze, 1873) from Japan (Coleoptera: Elateridae). Transactions of Essa Entomological Society 84: 57–60. (In Japanese, with English title)
Ôhira H (2001b) Notes on the morphological structure of *Suzukielater babai* from Japan (Coleoptera: Elateridae). Transactions of Essa Entomological Society 85: 8–11. (In Japanese, with English title and abstract)
Ôhira H (2002a) Notes on the morphological structure of *Agrypnus* species from Japan (I) (Coleoptera: Elaterae, Agrypninae, *Agrypnus*,). Miscellaneous Reports of the Hiwa Museum for Natural History 41: 53–67, pls 1–10.
Ôhira H (2002b) Notes on *Suzukielater babai* from Cape Irago, Aichi Prefecture. Chûfu (Bulletin of the Mikawa Insects Association) 41 (1): 3–4.
Ôhira H (2002c) Notes on some rare Elateridae from Kyushu (82). Kita-Kyûshû no Konchû 49 (2): 117–119, pl. 15. (In Japanese, with English title)
Ôhira H (2003a) Notes on the morphological structure of *Sabikikorius* species from Japan (II) (Coleoptera: Elaterae, Agrypninae, *Agrypnus*, *Sabikikorius* group). Miscellaneous Reports of the Hiwa Museum for Natural History 42: 31–43, pls 1–7.
Ôhira H (2003b) Notes on the generic position of *Anchastus*-species from Japan (Coleoptera: Elateridae, Physorhinini). Coleopterists' News 142: 19–21. (In Japanese, with English title and abstract)
Ôhira H (2004) Notes on the morphological structure of *Agrypnus* species from Japan (III) (Coleoptera: Elaterae, Agrypninae, *Agrypnus*, *Colaulon* group). Miscellaneous Reports of the Hiwa Museum for Natural History 43: 67–89, pls 1–14.
Ôhira H (2005) On the morphological structure of *Hatermelater* species from Japan (Coleoptera: Elateridae, Elaterinae, *Haerumelater*). Miscellaneous Reports of the Hiwa Museum for Natural History 44: 163–177, pls 1–10.
Ôhira H, Arimoto H (1976) Notes on some elaterid species from Tsushima Island. In: The Nagasaki Biological Society (Ed.) Tsushima no Seibutsu, Nagasaki, 365–370. (In Japanese)
Ôhira H, Suzuki W (1985) Elateridae. In: Kurosawa Y, Hisamatsu S, Sasaji H (Eds.) The Coleoptera of Japan in color Vol. III. Hoikusha, Higashiosaka, 53–92, pls 10–15. (In Japanese)
Ôtsubo S (2013) Records of Coleoptera collected and observed in Tanegashima Island (April 2002 to August 2007). Satsuma 149: 1–50. (In Japanese)
Ozaki T, Sato, F, Numata H, KanouH (2006) The Family Elateridae (Coeloptera) of Akita Prefecture, Northeast Japan. Akita Natural History Society, Akita, 76 pp. (In Japanese)
Schenkling S (1927) Elateridae II (Pars 88). In: Schenkling S (Ed.) Coleopterorum catalogus auspiciis et auxilio. W. Junk, Berlin, 264–636.
Schwarz G (1895) Ueber *Cardiophorus musculus* Er. als Vertreter einer besonderen Gattung. Deutsche Entomologische Zeitschrift 1895: 39–40.
Silfverberg H (1977) Nonmenclatoric notes on Coleoptera Polyphaga. Notulae Entomologicae 57: 91–94.